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C R O U P.

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AN

# INAUGURAL DISSERTATION

# **ON CROUP,**

PRESENTED AT THE PUBLIC EXAMINATION BEFORE THE  
MEDICAL FACULTY OF HARVARD UNIVERSITY FOR  
THE DEGREE OF DOCTOR OF MEDICINE,  
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BY J. H. WRIGHT.



## NORTHAMPTON:

J. H. BUTLER.

M DCCC XXXVIII.

THE Dissertation which I have ventured to offer to the reader was written while I was a pupil of Dr. J. H. Flint of Northampton. For nearly four years I have been privileged to observe his private practice and to watch the progress of this disease in a great number of cases. Indeed my remarks on the Treatment of Croup convey the substance of his instructions on this subject, and I have been greatly aided by his familiar conversations in the preparation of this essay. I have therefore presumed on a freedom of remark, which I hope will be tolerated, when it is understood that I have not been a mere looker on, but have had many cases of this formidable malady committed to my exclusive care. J. H. W.

## CROUP.

Croup is commonly employed, as a generic term, to designate an affection of the Larynx or Trachea, or of both, marked by difficult and sonorous respiration, hoarse or broken and suppressed voice, and a peculiar dry cough or bark, ringing as though it passed through a brazen tube. The disease may, with the Larynx and Trachea, also pervade the Bronchi to their minutest branches, without changing the character of its symptoms. There is also a grave affection of the Bronchi alone, which is attended by the same pathological distinctions, and has been called Bronchial Croup, though not marked by the peculiar symptoms, which have been mentioned.

We prefer to retain the popular term in our remarks on this subject without making any

pretensions to exactness of nomenclature. For though Croup, as thus defined, comprises two varieties of disease,—one inflammatory and the other spasmodic,—and though the former may be subdivided according to the degree and particular seat of the inflammation, still each affection is expressed by the same prominent symptoms, and these symptoms are referable to the same cause. The immediate exciting cause of the difficult respiration, the barking cough and the other characteristic signs of Croup is spasm of the Larynx, whether the disease be inflammatory or spasmodic. Any irritation capable of provoking spasm, whether it be direct or sympathetic, will produce “croupy sounds.”

Severe inflammation of the mucous membrane, both from the tumefaction of the membrane at first, and the exudation of false membrane afterwards, is a direct and mechanical cause of irritation and spasm. This constitutes one variety of Croup, (*Cynanche Trachealis. Pseudo-membranous Laryngitis.*) In these cases those constitutional symptoms which accompany local inflammation are super-added to the peculiar cough and the alarming changes in the voice and respiration, which

have been already referred to as the characteristic signs.

An oppressed and irritated stomach, and, according to some writers, even irritation from teething will also induce croupy symptoms in subjects predisposed by great nervous susceptibility to spasmodic affections. Thus we have another variety of Croup, constituted by this spasmodic affection, which is purely spasmodic and unattended with either local inflammation or general excitement.

There are, then, two affections, expressed by the same distressing and distinct local symptoms, though differing widely in the pathological conditions and the degree of danger attending them. We associate them together and designate them by the same popular term, because nearly every case of Croup exhibits the union of both to a greater or less extent.

Though we divide Croup into two varieties,—the inflammatory and the spasmodic,—and attach to each its appropriate name, though we may speculatively diagnosticate each with great exactness, yet in the practical consideration of the disease we shall find the former including the latter. Inflammatory Croup does not develop itself until spasm supervenes. Though

the narrowing of the rima glottidis, by mechanically obstructing the respiration, may occasion the symptoms which give us warning of the approach of the disease, yet we cannot account for the suddenness of the paroxysm only on the hypothesis that it is caused by spasm. The unsuspected inflammation generally progresses insidiously for a number of days, until spasms of the Larynx, provoked by direct irritation or by the sympathy with the stomach, *suddenly* induce alarming symptoms. In the same manner after inflammation has subsided, and there is an entire abatement of the general excitement, croupy paroxysms may occur with unmitigated severity, which must be referred solely to irritation. Is not this the case in some instances of what is called Chronic Croup, Typhoid Croup, &c.? The spasmodic may, under favorable circumstances, be exalted into an inflammatory affection: and in the course of the same attack may not inflammatory be converted into spasmodic Croup? It is one of Dr. Copland's pathological conclusions "that the relapses, which so frequently occur after intervals of various duration, and which sometimes amount to seven or eight, or are even still more numerous, may each present different states or

forms of the disease from others ; the first attack being generally the most inflammatory and severe, and the relapses of a slighter and more spasmodic kind."

While then it is of importance to decide at the outset whether an attack of Croup is inflammatory or spasmodic, it is equally important to determine how much is due to spasm alone in the progress of the inflammatory disease, in order to apply the appropriate treatment.

An acute inflammation of the Larynx or Trachea differing in no respect from other inflammations of the mucous membrane, unless it be in severity, occurring before puberty, may give rise to Croup. The inflammation is in many cases progressive, commencing with the Larynx and creeping down the Trachea into the Bronchi. The inflammation in this disease resolves itself by increased mucous secretions and by an exudation from the inflamed vessels. This exudation by the evaporation and absorption of its fluid particles speedily concretes into false membrane. When the inflammation proceeds from the Larynx downward the characteristic exudation follows its course. In most cases the history of the disease closes in asphyxia, not from spasmodic or mechanical

obstruction of the Trachea, but from effusion upon the Bronchial membrane, suspending the action of the air on the blood.

The formation of false membrane in the air-passages is considered a pathological distinction of this disease. In the dissection of fatal cases we observe a great variety of lesions, from an abundant viscid secretion, which seems to be but a slight modification of the natural mucus, to a tenacious and completely formed membrane.\* We must not necessarily regard the inflammation as specific—*sui generis*—because it results in the singular product which forms the false membrane. This result is not universal, and similar morbid lesions are the consequence of inflammation artificially induced in young animals, false membrane being completely formed in young subjects, when a sufficiently severe inflammation could be provoked.† The consistence and quality of the exudation vary with the intensity of the inflammation, whether spontaneously or artificially generated. The presence of false membrane, though it greatly aggravates the malady, by exciting spasm and mechanically obstructing the respi-

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\* Copland Dict. Pract. Med. Art. Croup, § 32—37.

† Experiments of Duval and others, Copland, § 40.

ration, is not essential to a fatal termination ;— but effusion upon the bronchial membrane to any great extent renders the case hopeless. Death often occurs before any membrane has been formed from the obstruction of the smaller air passages by the viscid secretion merely. We may always hope for recovery after the formation of membrane if the air passages can be kept free.

We have alluded to the doctrine of “inflammation sui generis,” because we believe its practical tendencies have been exceedingly pernicious in encouraging the employment of supposed specifics, to the procrastination or entire exclusion of those decisive means which are adequate to the urgency of the inflammation.

Brettonneau is the most distinguished and decided advocate of specific inflammation and specific local treatment. Mackensie, Weatherhead and others in England adopt similar views and recommend local applications to the fauces on the same principle. A great contrariety, in the general symptoms, exists between the disease as it occurs sporadically with us and the epidemic described by Brettonneau. Indeed, we must consider that disease as some-

thing very different from what we call inflammatory Croup, which may be identified with Angina Maligna, which spreads by contagion, in which fever is erratic and scarcely perceptible, and bleeding, general and local, blistering, vomiting and purging, pernicious, and local treatment with the internal use of calomel alone beneficial.\* If this be Croup, and its seat, local symptoms and pathology would lead us to suppose it very similar, it would seem to constitute a *congestive* variety of the disease. This conjecture is sustained by the fact of its prevailing epidemically, and stimulation, by means of muriatic acid to the affected parts, proving to be the most successful treatment. At any rate, the disease is widely different in a practical view from the one we are about to remark upon. The disease described by Bretonneau is probably identical with those cases of Scarlatina Anginosa, which we now and then meet with, in which the ulceration or exudation extends from the fauces to the Larynx and Trachea: as in the cutaneous phlegmasiæ generally, a natural determination to the skin supersedes the necessity of vigorous antiphlo-

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\* *Medico Chir. Review*, Oct. 1826, p. 419.

gistic measures, while a degree of general and local congestion would, in some cases, suggest a contrary course of constitutional treatment and the application of local stimulation. The disease seems to vary greatly in different countries, and hence there is a great variety in the descriptions and treatment of different writers.

As we do not intend to fill out an elaborate treatise on the subject of Croup, we shall go no farther into the history, symptoms and pathology of the disease than is necessary to illustrate the few practical considerations we are intending to suggest.

Inflammatory Croup is generally the sequel of a common catarrh, which may or may not have been attended with slight febrile excitement. We have been accustomed to watch the precursory signs of Croup with great care and to treat them with great promptness. A rough cough, uneasiness about the throat, loaded tongue, and an inflammatory blush of the fauces in a plethoric child, are symptoms which always awaken solicitude. We would prevent exposure to the cold as far as possible, and besides the usual precautions as to dress and diet, we provide for the prompt evacuation of the first passages by an emetic or an emeto-

cathartic. From five to twenty grains of ipecacuanha, combined with from one to ten of calomel, may be exhibited at bed time, and followed by an oily and terebinthinate laxative in the morning. This treatment is to be repeated every night until the local symptoms yield or the restoration of the mucous secretion renders the cough loose. In all affections of the air passages in young children the stomach often becomes suddenly oppressed with the tough mucous which is coughed up and swallowed, and perhaps by its own increased secretions. Great general excitement is the consequence, calling often for the daily evacuation of the stomach.

It is during this season of increased excitement that the local inflammation is increased and those spasms of the Larynx supervene which constitute the paroxysm of Croup. By seasonable evacuations of the stomach we can thus forestall one of the most active exciting causes of croupy symptoms.

Should the catarrhal symptoms continue obstinate after the evacuation of the first passages, it may be proper to create a stronger derivation to the bowels by small doses of ipecac and calomel during the day, vomiting being

procured by an increased dose of ipecac at night. We have pursued this treatment in a great number of instances with the satisfaction of seeing an incipient inflammation, which, if neglected, might have arrived at a severity constituting Croup, stayed in a mild form and kindly yielding in a few days. We find it difficult to instance a case in which these means have been defeated and the croupy paroxysm supervened. We do not suppose that the catarrhal signs, we have alluded to, are in every instance the unfailing prognostics of Croup. Nature, if unaided, would in many cases have controlled the disease before it eventuated in Croup. Yet if we meet promptly the dubious symptoms of every case, we shall have the happiness not only to procure the abatement of the milder malady, but of fore-stalling severe disease in not a few instances.

The milder catarrhal symptoms exist from one to four days. The increasing roughness of the cough is generally the only indication of approaching disease. Some observers say that a very close inspection of the membrane of the mouth will sometimes disclose a slight degree of inflammation. The paroxysm occurs sud-

denly, sometimes induced by exposure to the cold, and sometimes by sympathy with an oppressed stomach. Thus the child is generally attacked at night after a hearty supper.

It is often difficult to decide during the first paroxysm whether inflammation is present or not, or rather whether inflammation exists to such a degree as to call for the immediate employment of the more decisive antiphlogistic measures. The constitutional symptoms are in some cases so marked as to enable us to decide this question at once, especially when we place in connexion with them the existence of previous catarrh. But there are cases of a mixed character in which the evidence of inflammation is obscure,—cases in which we are doubtful, how much is to be ascribed to spasm provoked by inflammation, and how much to spasms excited solely by some sympathetic irritation. A slight degree of local inflammation may be present, just sufficient to predispose the larynx to spasmodic action, without calling for any definite and decisive antiphlogistic measures. The evacuation of the stomach and the general and local employment of anti-spasmodics allay almost immediately every alarming symptom. It is in attacks of

this kind that the successful use of emetics, snuff, tobacco, opium, and numberless domestic specifics, have given these means an undeserved prominence in the treatment of inflammatory Croup, to the exclusion of bloodletting and other antiphlogistic measures. Evacuants and anti-spasmodics may be relied upon when there is but a slight inflammation of the air passages, because it would not eventuate in the formation of membrane if left to run its course uncontrolled.

When called, therefore, to treat a case of Croup during the first paroxysm, in which there is any doubt as to its precise character, we would first direct our attention to the removal of any direct or sympathetic cause of irritation, which may have induced spasm. To effect this object the indications are,

- 1st. The evacuation of the first passages.
- 2d. The local application of anti-spasmodics.
- 3d. An equal diffusion of warmth.

We would then envelope the patient in warm flannel, apply dry heat to the extremities, and, if necessary, resort to frictions, sinapisms to the feet, &c. &c.\*

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\* Dry heat and dry frictions aided by rubefacients are preferable to the warm bath, as a means of procuring an equable warmth of surface and deter-

The exhibition of ipecac and calomel combined, followed in a few hours by an oily laxative is a safe and certain means of procuring the requisite evacuations. An embrocation to the throat and chest of camphorated oil and opium, with or without the addition of an irritant, as the oil of turpentine, exerts an excellent and speedy control over the spasmodic action of the Larynx.

We await the operation of the emetic. If the paroxysm is thereby relieved and the general excitement does not demand immediate venesection it is generally safe to postpone further measures for a few hours. The patient may then be tranquilized by sleep and copious evacuations of the bowels will be obtained. Thus if the paroxysm occurs at midnight, the patient may be left until morning, when we shall be able to judge of the case with more deliberation and precision.

When the precursory history of the disease and the general excitement at its access leave

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mination to the skin. The application of warm water produces sudden warmth, but unless proper precaution is taken, the evaporation of it induces an equally sudden and proportionate degree of coldness; this principle is not understood by many who employ it as a domestic remedy. Besides the simple process of applying warm flannels, &c., is attended with much less confusion and loss of time than the preparation of the warm bath, when there are no special conveniences for the purpose.

no doubt that severe inflammation exists, blood-letting should not be postponed a moment. We would have it employed before the administration of emetics and cathartics. We should thus not only make an immediate impression on the circulating system, but provide secondarily for the more seasonable and kind operation of medicine.

In the country, where medical advice cannot always be seasonably procured, the physician does not see the patient until the remission after the first paroxysm. Vomiting has perhaps been procured by some domestic expedient, or it has taken place spontaneously. There is now a complete subsidence of the more alarming symptoms. Medical aid is at no time more important than at this; at no time is one more perplexed in deciding on the appropriate plan of treatment.

Is there inflammation of the air passages? If there be, is it so severe as to call for decisive means? How shall we decide these most important points? The great improvement in the respiration, the restoration of the voice, the infrequent cough, the absence of all uneasiness about the throat and the buoyant spirits of the

patient will often conspire to allay apprehension. Yet with all these promising symptoms it has often proved a fatal error to set aside bloodletting for milder antiphlogistic means.

Promptness in deciding is here required : a temporizing policy may jeopardize the life of the patient. If the inflammation eludes detection it will insidiously progress until a renewal of the paroxysm discloses the disease arrived at a severity baffling all the resources of medicine.

In forming our diagnosis at this important period we must rely upon the constitutional indications of inflammation and upon the state of the mucous secretion of the air passages.

One of the surest signs of inflammation is the absence of the mucous secretion. If the voice and cough indicate dryness of membrane, (and we may ascertain this by provoking coughing or crying,) or if the application of the ear to the throat and chest discloses the same, we may be confident that severe inflammation is at work. Notwithstanding the general tranquillity, we may be sure that our apprehensions will be realised, and the paroxysm renewed ; and if we would prevent a fatal issue, bloodletting should not be post-

poned a moment. We may have made mere dryness of membrane a subject of unnecessary alarm and subjected the patient to unnecessary depletion, but it is a satisfaction to reflect that we have made his security certain. The absence of the mucous secretion, though a slight and often obscure symptom, is sometimes the only one on which he can rely in the tranquil interval after the first paroxysm. The pulse, the general excitement, the appearance and sensations of the throat, sometimes afford evidence of inflammation,—but they very often give us no warning.

The real difficulty of venesection in some cases, and a repugnance to the operation on the part of the patient, parent and physician, in all cases, together with the complete freedom from all alarming symptoms, have too often prevented an early recourse to blood-letting. This error is irretrievable. Emetics and cathartics may arrest the disease, as they often have done in instances which, if neglected, would have eventuated fatally. Yet in the ordinary practice of the country a reliance is placed on these means in the early stage of inflammation, which permits the unchecked progress of the disease and renders nugatory

the most appropriate subsequent measures. The assiduous exhibition of emetics and nauseants may be generally adequate to arrest inflammation of the pulmonary tissues,— but in this disease their operation is so uncertain, and the time for making a salutary impression is so short, that bloodletting becomes an incomparably safer expedient. While we have seldom, if ever, witnessed ill effects from copious depletion, it has been a matter of unspeakable regret, that we have delayed the abstraction of blood, trusting too confidently to the efficiency of other means, until there was unequivocal evidence of the formation of adventitious membrane in the trachea or of effusion on the bronchi.

If we decide that the disease is purely spasmodic, we then adopt those means which are calculated to remove general and local irritability and any accidental cause of spasm, and thus prevent its recurrence. These same indications, let it be borne in mind, are present even if we decide that the disease is inflammatory, and similar means are to be adopted so far as they are consistent with the antiphlogistic plan.

Bloodletting, in whatever manner procured,

unless carried to faintness, fails to make an impression sufficiently permanent. When we use the lancet we prefer to open the external jugulars, as the operation is more safe and certain.

Leeches cannot always be obtained seasonably, nor in sufficient quantities, especially in the country : and if they could be procured the timidity and struggles of the patient would often preclude their use. Cupping is not available for the same reason.

After bleeding, a weak solution of tartrated antimony or small doses of ipecac and calomel, or both, may be given at intervals of from one to six hours, according to the urgency of the symptoms. When the general excitement does not forbid it, opium may be carefully given in combination, for the purpose of removing irritability. It has been objected to the internal administration of opium, in any stage of this disease, that it disposes to constipation. It would seem to be an a priori conclusion, for we have invariably found that when combined with the mineral alterants, by removing irritability and restoring regular action, it promoted rather than retarded the operation of medicine.

The stomach should be evacuated as often as it becomes oppressed with accumulations which have passed into it from the air passages. An emetic often gives great relief, because the spasms of the Larynx may be renewed, from sympathy with the stomach.

In very young children the stomach may be evacuated twice or thrice daily with benefit. As it is important to keep a steady determination to the bowels, ipecac and calomel may be combined together in alterant doses, or as an emeto cathartic, alternated with the antimonial solution, and followed by castor oil and turpentine, or some other laxative.

I have heard of practitioners who contend that there is no advantage in procuring evacuation in this disease. When we consider the manner in which evacuations are often procured, we are almost disposed to concur in the opinion, at least so far as this, that great injury results from forcing the stomach and bowels with powerful drugs when mild means have failed to answer the purpose. There is always in this disease a degree of asphyxia, from the imperfect action of the air on the blood, which renders all the organs peculiarly insusceptible. When, therefore, large doses of tartarized

antimony, turpeth mineral, &c. &c. are persisted in, the reactive power of the stomach is completely overborne, before vomiting is excited, if it can be at all, and the patient perishes in the early hours of the invasion—not of Croup—but a victim of medicine.\*

Evacuants are most successfully administered during the remission, when the natural susceptibility is restored by the circulation of more perfectly arterialized blood. While the organs are oppressed by the general asphyxia, it is as idle to attempt to arouse them by large doses of irritating drugs, as to restore sensation to a palsied limb by blisters, while the nerves are compressed by a ligature. It often happens that the torpor of the bowels is the secondary effect of congestion of brain† induced by the efforts of the patient and by local spasms. It is, therefore, good policy to employ those means which will remove cerebral congestion. We have in this and other diseases, greatly relieved the vessels of the head

\* A child in the neighborhood was attacked with severe Croup about midnight. A medical practitioner was called upon, who commenced operations with great vigor, by giving, according to his own elegant phraseology, "tartar emetic enough to puke fifteen men." His patient died in convulsions before morning,—but not of Croup. In another case eight grains of Turpeth Mineral were given at a dose, in the last stage of the disease.

† Prof. Eberle.

by drawing blood from the nostrils. A sufficient flow of blood may be obtained by plunging the lancet into the septum of the nostrils, and the haemorrhage may be commanded at any moment by pressure.

Notwithstanding the employment of these measures the paroxysm may be repeated. In order to subdue inflammation and mitigate the symptoms, repeated bleedings are often necessary. We should not spare the lancet until we are sure that the inflammation is controlled.—But we must not lose sight of the fact, that in every stage of the disease much is due to spasm. After the inflammation begins to abate severe paroxysms may occur in consequence of the irritability and spasmodic *habit*, (if I may use the expression) of the larynx. We should, therefore, be cautious not to carry depletion too far, when the paroxysms are to be attributed to the extreme susceptibility of the larynx to spasm rather than the obstinacy of the inflammation, since bloodletting would only enhance the difficulty we are seeking to remove, by engendering greater general irritability.

It is exceedingly difficult to decide, with the closest observation and discernment, when antiphlogistic measures are to be dispensed

with and when we may rely on the internal use of opiates. It is impossible to give any rule by which we may unerringly distinguish inflammation from irritation. The history of the case, the effect of treatment, the state of the organs, particularly of the stomach, the idiosyncrasies of the patient, and the constitutional symptoms at the time must all be carefully considered.

We have alluded to the use of anodyne embrocations to the throat. These may be continued through the whole course of the disease. The tobacco leaf or the plaster of snuff may be used on the same principle and have sometimes a very powerful effect. An excellent extemporaneous preparation is made by throwing together equal parts of camphor spirit, olive oil and laudanum. This may be applied warm with considerable friction, and a moderate degree of external warmth may be preserved by a fold of cotton batting thrown loosely around the neck. We shall thus obtain the anodyne effect of the opium and keep up a safe derivation to the skin.

But little benefit is derived from the application of direct irritants to the throat during the

stage of excitement. When the general excitement is somewhat abated, it may be well to add some irritant to the embrocation or substitute a mercurial ointment in its place. Blisters may be also beneficially applied to the limbs and back, "*but never to the throat.*"\*

Our own experience, and all our notions *a priori*, would lead us to protest strongly against the practice of vesicating the throat, which is still adhered to by many, though condemned by some of the best writers on the subject.

On the application of a blister to the throat the inflammation has been renewed in an aggravated form and the tendency to spasm greatly increased.

Cheyne advises vesicating the throat and yet holds the following equivocal language with regard to his own experience: "*I have seldom omitted a blister to the neck, and I believe it to be a valuable addition to the plan of cure, though I cannot affirm this upon my own experience.*" In a number of cases appended to Cheyne's essay, the application of the blister was followed by a severe exacerbation. He

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\* Copland.

wrote a practical treatise from his own experience. We have noticed in the dissection of fatal cases, in which a blister has been applied, an effusion of lymph into the cellular membrane over the inflamed parts of the trachea. If this intense inflammation was not increased, it certainly was not diminished by the contiguous vesication.\*

Cases are sometimes referred to, as examples of the inefficiency and injurious effects of excessive depletions, which are, after all, but illustrations of the powerful action of blisters in kindling up inflammation anew and thus defeating the most prompt and appropriate antiphlogistic measures. While we consider counter irritation "as a valuable addition to the plan of cure," we would exempt the throat and chest from all applications except of a soothing kind during the stage of excitement and from very extensive or long continued irritation subsequently.

When we consider that a susceptible child may be thrown into convulsions by the application of blisters, we may believe that irritation of the throat is the very best means of provoking

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\* Dr. Flint.

spasm of the air passages already in a state of irritability.

We subjoin the following case as a more full illustration of the plan of treatment :

October 6th, 1836. I was called to visit a robust and ruddy child two years and a half old, with the symptoms of the advanced stage of Croup. I learned that the child had for some weeks been the subject of a common cold. Nine days ago the cough became hard and ringing — the respiration sibilous. To these were added constitutional symptoms — flushed cheeks — harsh and dry skin — the heat was and had been variable, but always above the temperature of health. The disease from its access had been modified by the judicious management of the parents. Mild emetics and purges had been given, and various domestic remedies employed both externally and internally. There was not much alarm until two days ago,—the seventh since croupy symptoms were manifested. On the evening of the eighth day all the symptoms had become so urgent that a neighboring practitioner was called in, who, apprehending the formation of membrane, pronounced it too late to bleed. He gave a powerful emetic, which procured free vomiting

of a thick, glairy fluid. The parents thought that fine shreds, and patches were also dislodged.

When I saw the child, on the morning of the ninth day, a partial remission had taken place — I did not make any minutes of the symptoms at the time. The characteristic respiration, cough and voice of croup were present. The paroxysm returned by afternoon. The patient was then in great distress from the difficulty in respiration and the constant suffocating cough. The face was deeply suffused — plum colored. The eyes watery. Patches and shreds of whitish membrane were expectorated or rejected by vomiting. The pulse was hard and frequent,—the heat of skin not much above natural.

I opened the jugular vein and bled to approaching syncope. As the ingesta had been thoroughly evacuated I directed once in four hours the following powder :

Sub. Mur. Hyd. grs. ii.

P. Ipecac. . . . grs. ii.

Half ounce of castor oil in the intervals until evacuations of the bowels were procured. If the stomach perseveringly rejected the oil, or if a movement of the bowels was long delayed, a

mild but full injection was to be administered. An embrocation to the throat of equal parts of table oil, camphor spirit and laudanum. To be applied warm and warmth preserved by a cravat of cotton batting. Blister to the spine from the fifth cervical to the last dorsal vertebra. Stimulating applications to the feet. An equable diffusion of warmth by warm and dry flannels, &c.

Before I left the patient, the more urgent symptoms had been relieved.

10th. Vomiting of glairy matters followed the exhibition of each powder. No well marked paroxysm had occurred since the bleeding yesterday. The heat had somewhat increased; the pulse was more full and free. Bowels had not been opened.

The same means to be continued. Injection to be repeated if necessary to procure evacuations before noon.

11th. The child is better, though there have been several paroxysms. The tongue has somewhat improved. Cough and breathing less difficult. The countenance has lost much of its purple hue. The face is flushed. The heat higher than it was at first. Pulse about the same as yesterday. The stomach and

bowels have been several times evacuated since yesterday morning. Shreds of membrane have been expectorated. Directed 1-12th of a grain of tart. antimony in solution to be given once in six hours alternating with the powders of ipecac and calomel. Castor oil to be continued once in six hours, a few drops of oil of turpentine to be added to the dose of oil.

12th. Improvement in all the symptoms since yesterday. In connexion with the opiated embrocation a mild mercurial ointment was directed to be applied to the throat thrice daily.

The amendment subsequently was gradual and progressive. The paroxysms were less frequent and less severe, generally terminating by the expectoration of a patch of membrane. The bowels were more obedient and the secretions natural. After the general excitement had somewhat declined, the continuance of the cough and a degree of general irritability seemed to call for the use of opium internally. I have found in other cases, that a degree of irritability often supervened on the acute disease, even when we were so fortunate as to prevent the formation of membrane. Some would perhaps attribute this to disproportionate general bleedings. Yet this would not con-

stitute a valid argument against bold measures, for they are incomparably the safest. In this stage and form of the disease we must place our entire reliance on anti-spasmodics.\*

Though this state of irritability is attended with very much the same local symptoms as inflammation, the constitutional symptoms will in this stage serve to distinguish it, and point out the appropriate plan of treatment. The pulse and the heat of the skin indicate debility rather than excitement. The tongue is sometimes of a deep scarlet color. It would be a fatal mistake to resort to depletion under these circumstances : without doubt the croupy cough and difficult respiration are often enhanced by the untimely repetition of venesection. We might adduce cases from our own observation and that of others in support of this opinion. Perhaps in no disease do the symptoms which denote inflammation and irritation so completely simulate each other as in this. The reason is obvious. The local symptoms in

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\* The opium may be advantageously combined, in the form of a tincture, with the antimonial solution. The antimony, by making an impression, seems to prepare the way for the opium and to give a permanency to its effects. Thus through the aid of the antimony, smaller and less frequent doses of opium may be made to answer the purpose.

either case depend on the same cause—the spasmodic affection of the larynx.

It occasionally happens that depletion is promptly and copiously employed early in the disease and even twice repeated. Yet the physician is perplexed at the obstinacy of the symptoms which are rather aggravated than abated. There are no appearances of the formation of membrane, but the cough continues shrill and ringing, and the respiration irregular. The exacerbations are frequent and irregular. In such a case we would discriminate carefully between irritability and inflammation.

Most authors have divided the disease into different periods or stages, regarding sometimes the pathology and sometimes the diversity of the symptoms. We may instance Cheyne, who considers the disease under two stages, the inflammatory and the purulent: the one antecedent and the latter subsequent to the formation of membrane. Copland notices, first, the precursory signs,—then the developed or confirmed state, and lastly, the state of collapse. Although these arbitrary arrangements may have contributed to perspicuity of descrip-

tion, they have been a fruitful source of practical error. We are left to infer, that after the formation of membrane, the disease changes its type, and that a corresponding change of treatment is indicated, to the exclusion of the anti-phlogistic means of the preceding stage.

We are told that when the disease, through neglect or inefficient management, has arrived at the last or post-membranous stage, then the only indications are, by all appropriate means, to provoke the discharge of the membrane, subdue suffocating spasms and sustain the vital energies. We believe that these indications are present, but it seems to us that there is one more important indication which is overlooked, viz.:—to arrest a progressive inflammation.

After assiduously employing blisters, emetics, expectorants, narcotics and diffusibles, on the hypothesis that the period of inflammation had past, we find it difficult to refer to a single instance of recovery from this stage of the disease.\* Indeed it is with deep mortification that we have witnessed the *means of cure*, fore-stalling the disease in hastening the case to a fatal termination. Entire relief of the more

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\* Dr. Flint.

urgent symptoms has often followed the expulsion of a patch of membrane, and we have been ready to foster some trembling expectations of rescuing the patient. And when after a few hours our hopes have been all dashed by the patient's sinking into asphyxia, by a renewal of the membrane, or by an extension of it, or by effusion into the bronchi, we have been led to suspect that the stimulant and expectorant plan failed of reaching all the indications of cure.

Are we not, in fact, to regard Croup in many cases as a disease of *progressive inflammation* — a disease of inflammation to the last? Though the inflammation may have run its course to exudation in the parts first attacked, it may be at its zenith in parts subsequently affected. While, therefore, the presence of membrane in one part of the trachea calls for the assiduous employment of all appropriate means to aid its expulsion, the existence of inflammation, in the lower portions of the air passages, demands the employment of anti-phlogistic means also. In these cases (and they are many) in which the inflammation commences with the superior part of the trachea and descends gradually to the bronchial tubes, the disease does not prove fatal until there is an

exudation on the bronchial membrane, which precludes the action of the air on the blood.\*

Though we may be fortunate enough to procure the expulsion of a patch of membrane, much to the relief of the patient, still there is but slight ground for hope unless we can prevent a renewal of it and the fatal obstruction of the air passages. Is not then a perseverance in antiphlogistic means indicated in this stage of the disease, as well as the discreet employment of expectorants and stimulants? If bloodletting has not been carried to the utmost is it not important to employ it even now, as far as the circumstances of the case will warrant, as the means of subduing inflammation?

The history of most of the cases, which have fallen under my observation, before death, and the appearances disclosed on examination after death, go to prove the progressive extension of the disease from the upper to the lower portions of the respiratory tube.

A completely formed and firm-bodied mem-

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\* Cheyne says that death occurs in this manner in nine cases out of ten. We do not on dissection often find the trachea impervious to the air from the obstruction of foreign matters, but it is possible that a state of contraction of the glottis might result from the high degree of irritation, and continue just long enough to suffocate the patient, and yet be relaxed after death.

brane lines the superior portion of the trachea, which as we descend gradually loses its tenacity and consistence, until it becomes a mere delicate film, and in the bronchi an accumulation of glairy fluid only. On the hypothesis, that inflammation assails all parts of the respiratory tube simultaneously, we are unable to account for the variety in the morbid lesions of the different parts, indicating different stages of disease, and of course successive periods of its access. When we place in connexion the fact that the functions of the lungs are not fatally interrupted, until long after there are unequivocal evidences of the formation of membrane, and that death often takes place from some sudden and altogether unexpected exacerbation, the proof of the progressive extension of the disease seems complete.

A slight inflammatory blush of the throat is noted by some as a common symptom before accession of croupy symptoms. Prof. Eberle says that both Brettonneau and Mackensie assert "that the inflammation often commences in the fauces and on the tonsils, and descends thence into the trachea." "I have myself," he adds, "seen several cases of Croup, which commenced by a kind of erysipelatous or super-

ficial inflammation about the tonsils and soft palate." Bronchitis is a sequel of Croup. This law of progressive inflammation seems to hold good with regard to other affections of the mucous membrane of the air passages. No one can have failed to have observed the progressive development of a common cold. A nasal catarrh is the most common precursor of the cough. Dr. Latham, speaking of the physical signs of Peripneumonia Netha, says that if Auscultation informs him aright, "the inflammation does not arise at once and over the whole surface which it is destined to pervade, but travels over it progressively; so that various portions of the same continuous surface are in different stages of inflammation at the same time. How possible this is, every one knows who has watched erysipelas travelling over the whole body."

If then we are still to deal with inflammation even in the last stages of the disease, what means are we to resort to? Dr. S. Jackson reports a case in Am. Jour. Med. Science, p. 361, vol. iv., in which the application of leeches to lower part of the throat and chest was attended with success. M. Jadelot, senior physician to the Hospital for Children in Paris,

"directs leeches to be applied when the presence of false membrane is suspected ; but the moment they fall off he hastens to produce vomiting." When the condition of the patient will permit, general bloodletting may be resorted to. The apprehension of exhausting the vital energies should not have too much weight in deterring us from bloodletting at a late period. The sinking of the vital powers is occasioned chiefly by the circulation of imperfectly arterialized blood ; to lessen the volume of the general circulation is taking one important step to improve the circulation through the lungs. The disposition to asphyxia is thus removed and the vital energies preserved. During this state of oppression, the enfeebled pulse will be found to rise, the hue of the skin to be improved, the vital power to rally.

This disease seems to vary greatly in different countries. The peculiar character of the epidemic described by Brettonneau of Tuors, has been noticed. By others the disease is regarded as essentially spasmodic. Prof. Eberle quotes Prof. Nasse as considering "disturbed or impaired function of the Pneumogastric nerves as the proximate cause of the

disease. The symptoms bearing a very strong resemblance to those which result from dividing the eight pair of nerves." The generality of the German and French practitioners are said to entertain similar opinions. Perhaps the views we have presented will reconcile in a measure these discrepancies of opinion by regarding the inflammatory affection as manifesting itself by provoking spasmodic action. In the vicinity of Connecticut River, where I have been privileged to observe many cases of Croup, I have found the disease in a majority of instances of an inflammatory type, and one of severe inflammation. And if there be any treatment, which is entitled to be considered as specific, it is the prompt, fearless and persevering use of the lancet. Under such treatment I have found this formidable malady as manageable as any other. While from considerable investigation with regard to the treatment of the disease in that part of the country, I am prepared to assert that when the emetic and expectorant plan is exclusively adopted, there is no disease which is proportionally more fatal. Indeed, but a few years ago, it had come to be a proverb among the vulgar, "that children must always die of the rattles."



